Electronic Version
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Claims

[c1] An imaging detector assembly comprising:
a detector array;
a scintillator assembly positioned in communication with said detector array;
a first collimator array optimized to shield said scintillator assembly, said first collimator array mounted to said scintillator assembly; and
a second collimator array optimized to reduce x-ray scatter, said second collimator array mounted independently from said first collimator array.

[c2] An imaging detector assembly as described in claim 1, wherein said first collimator array has a first collimator width optimized to shield said scintillator and a first collimator height with minimal effect on said x-ray scatter.

[c3] An imaging detector assembly as described in claim 1, wherein said second collimator array has a second collimator height optimized to reduce said x-ray scatter and a second collimator width with minimal effect on shielding said scintillator.

[c4] An imaging detector assembly as described in claim 1,

wherein said first collimator array and said second collimator array are comprised of high-Z, high atomic number materials.

[c5] An imaging detector assembly as described in claim 1, wherein said first collimator array is comprises of a material optimized to shield said scintillator.

[c6] An imaging detector assembly as described in claim 1, wherein said second collimator array is comprised of a material optimized to reduce x-ray scatter.

[c7] An imaging detector assembly as described in claim 1, wherein said second collimator width is less than 200 microns; and
said first collimator width is greater or equal to said second collimator width. .

[c8] An imaging detector assembly as described in claim 1, wherein said first collimator array is comprised of a loaded epoxy formed directly onto said scintillator array.

[c9] An imaging detector assembly as described in claim 1, wherein said first collimator array is comprised of a plunged electron discharge machined grid formed onto said scintillator array.

[c10] An imaging detector assembly as described in claim 1,

wherein said first collimator array is comprised of a grid formed directly onto said scintillator array.

[c11] An imaging detector assembly as described in claim 10, wherein said grid comprises an etched grid etched directly onto said scintillator array.

[c12] An imaging detector assembly comprising:
a detector array;
a scintillator assembly positioned in communication with said detector array, said scintillator assembly comprised of a plurality of scintillator cells separated only by thin film reflectors;
a first collimator array optimized to shield said scintillator assembly, said first collimator array formed directly onto said scintillator assembly; and
a second collimator array optimized to reduce x-ray scatter, said second collimator array mounted independently from said first collimator array.

[c13] An imaging detector assembly as described in claim 12, wherein said first collimator array is comprised of a composite grid formed directly onto said scintillator array.

[c14] An imaging detector assembly as described in claim 12, wherein said first collimator array is optimized to im-

prove the quantum detection efficiency of the imaging detector assembly.

[c15] An imaging detector assembly as described in claim 12, wherein said first collimator array has a first collimator width optimized to shield said scintillator and a first collimator height with minimal effect on said x-ray scatter.

[c16] A method of forming an imaging detector assembly comprising:
optimizing a first collimator array to generate scintillator shielding properties;
mounting said first collimator array onto a scintillator assembly, said scintillator assembly comprising a plurality of scintillator elements;
optimizing a second collimator array to reduce x-ray scatter;
mounting said second collimator array independently from said first collimator array, said first collimator positioned between said scintillator and said second collimator array.

[c17] A method of forming an imaging detector assembly as described in claim 16, further comprising:
manufacturing said second collimator array with greater tolerances than said first collimator array.

[c18] A method of forming an imaging detector assembly as described in claim 16, further comprising:
removing said second collimator array for use in a fourth generation imaging assembly.

[c19] A method of forming an imaging detector assembly as described in claim 16, wherein said mounting said first collimator array comprises:
forming said first collimator array directly onto said scintillator assembly.

[c20] A method of forming an imaging detector assembly as described in claim 16, wherein said mounting said first collimator array comprises:
etching a grid onto said scintillator assembly.

[c21] A method of forming an imaging detector assembly as described in claim 16, further comprising:
separating each of said plurality of scintillator elements only by thin film reflectors; and
optimizing a first collimator width to generate an x-ray shielded portion that performs as an x-ray attenuator to reduce x-ray scatter within each of said plurality of scintillator elements.